7-1930

Circular No. 88 - Annual Summary of Publications

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UTAH AGRICULTURAL EXPERIMENT STATION

CIRCULAR 88 **JULY, 1930**

ANNUAL SUMMARY OF PUBLICATIONS[1]

Blanche Condit Pittman

Circular No. 88 contains a summary of publications issued by the Utah Agricultural Experiment Station, through its Editorial and Publications Division for the fiscal year ending June 30, 1930. The publications of this Station are no longer sent to a general mailing list (except in the case of libraries, state editors, Utah county agricultural agents, state vocational teachers, and state agricultural inspectors) but are sent only **on request.** Therefore, copies of any of these publications listed will be sent without charge to those requesting them **as long as the supply is available.** However, in the case of reprints (abstracts of technical and scientific articles) the supply is **limited,** and requests for these should be confined as far as possible to those only who are especially interested in this phase of experimentation.

Check those publications desired. Fill in name and address in space provided above **(write or print legibly).** Place this circular in a stamped envelope and send to

Division of Publications,
Utah Agricultural Experiment Station,
Logan, Utah, U. S. A.

BULLETIN 212—STUDIES ON THE MORPHOLOGY OF THE BEET LEAFHOPPER

George F. Knowlton

This is a study of the general external and internal morphology of the homopterous vector of the virus disease curly-top. This plant disease is frequently very destructive to the sugar-beet crop in many parts of western United States. The principal aim is to illustrate and describe the various structures in such a way that they may be readily recognized. It is hoped that this may be of some assistance to workers interested in the disease but unacquainted with insect structures. Particular attention is paid to the digestive system and its accessory glands, as they appear to be the organs most closely associated with disease transmission. A list of 44 references is included.

[1]Contribution from Editorial and Publications Division.
Publication authorized by Director, July 1, 1930.

BULLETIN 213—FOOD HABITS OF UTAH FARM FAMILIES

Almeda Perry Brown

Not "when do we eat", but "what do we eat" is the question answered in this bulletin. The "we" refers particularly to farmers of Utah, whose habits were ascertained by a study of the foods consumed by some 43 Utah farm families selected from widely differing communities. One table indicates that the nutritive value of the average family diet in the Utah farms studied averages lower than in any other recent study made in other states. Measured in calories per adult male unit per day the Utah diet showed 3049. The reports came from two general types of farming communities in 11 counties. The first type was communities on general farms, whether near or farther from a city or town; the second represented specialized farms growing either dry-land wheat or alfalfa-seed.

BULLETIN 214—AN ECONOMIC SURVEY OF THE "DIXIE" SECTION, WASHINGTON COUNTY, UTAH

W. P. Thomas

This bulletin represents a preliminary economic survey of the agriculture of the "Dixie" section of Washington County, with special reference to truck crop and fruit production and marketing, made during the winter of 1928 and the early spring of 1929.

Farm records were secured from 69 representative farmers of this district. Similar data were secured during the fall of 1928 from the producers of Moapa Valley, Nevada, where climatic and marketing conditions are similar to those in Washington County. A comparison between the two studies is included in this bulletin.

BULLETIN 215—COST REDUCTION IN DRY-FARMING IN UTAH

P. V. Cardon

Continued pressure for cost reduction in dry-farming in Utah has resulted not only in the adoption of more economical uses of labor and equipment but also in a notable tendency toward power farming, much of which is being done on a custom basis. This briefly summarizes the findings of this study.

After tracing the efforts of Utah dry-farmers during the last quarter of a century to reduce costs, the author presents a summary of cost records kept during 1926 and 1927 by 40 dry-farmers in Cache, Boxelder, Tooele, and Juab Counties. A total of 11,054 acres of land is represented in the study, the farms averaging in size 313.2 acres. These records reveal many interesting facts pertaining to dry-farming practices in Utah.

BULLETIN 216—NOTES ON MISCELLANEOUS INSECTS OF UTAH

Herbert J. Pack[2]

Compiled by G. F. Knowlton

This bulletin deals rather extensively with the life history, habits, and control of the gooseberry fruit worm. Other fruit insects considered are the lesser bud moth, peach twig borer, codling moth, cigar case bearer, and strawberry root

[2]Died January 5, 1930.

weevil. The sugar-beet crown borer, pale western cutworm, miscellaneous cutworms, alfalfa semi-looper, squash bug, potato psyllid, and wheat straw worm are considered. A list of Lepidoptera, which had been collected and determined, is included. In the supplement, the bean thrips and clover leaf weevil are taken up, combining the work of Dr. Pack and two of his advanced students, C. H. Smith and L. C. Fife.

BULLETIN 217—PRICES OF FARM PRODUCTS IN UTAH

W. Preston Thomas

The purpose of this bulletin is to indicate, by means of price data, the relative position of Utah's agriculture, the agriculture of the United States as a whole, and industrial enterprises. The study includes the relationship of farm prices from 1915 to the present time. Included are prices of relationship in regard to beef cattle, cattle, lambs, wool, butter, eggs, hogs, horses, wheat, oats, barley, alfalfa-seed, sugar-beets, canning peas, apples, potatoes, and hay.

BULLETIN 218—THE ALFALFA-SEED CHALCIS-FLY IN UTAH

Charles J. Sorenson

The alfalfa-seed chalcis-fly has been found doing damage in all parts of Utah. Examination of seed samples from 75 representative fields in 1926 showed an average "fly" infestation of 9.13 per cent; in 1927, 90 fields contained a 9.75 per cent infestation; in 1928, 123 fields contained an infestation of 11.51 per cent; and in 1929, 179 fields showed an average infestation of 24.37 per cent. As a result of life-history studies in the Uintah Basin, it has been found that the greatest number of eggs hatch in four days; the feeding period of larvae averaged 10.5 days; the pupal period of summer broods averaged 11.8 days; and over-wintering broods averaged 16 days; the period from eggs to adults averaged 23 days in summer. Two complete broods and a partial third brood of larvae have been found annually. Suggestions for prevention and results of experiments for control of chalcis-fly are also contained in this publication.

BULLETIN 219—TWENTY-EIGHT YEARS OF IRRIGATION EXPERIMENTS NEAR LOGAN, UTAH, 1902-29, INCLUSIVE

D. W. Pittman and George Stewart

Since 1902 irrigation experiments have been a major part of the research activity of the Greenville (Central) Experimental Farm near Logan, Utah. These experiments have been concerned chiefly with the effects of different quantities of irrigation water, the minimum water crop requirement, and the effects of different seasonal distribution of water. Bulletin 219 gives a brief summary of this work as it relates to crop yields including the more recent results up to and including 1929. Thirteen illustrations are also given.

CIRCULAR 78—ANNUAL SUMMARY OF PUBLICATIONS

Blanche Condit Pittman

This circular contains a summary of publications issued by the Utah Station from July 1, 1928 to June 30, 1929. In this circular the following bulletins and circulars are summarized: Bulletins Nos. 208, 209, 210, and 211; Circulars 73, 74, 75, 76, and 77. Twenty-two abstracts of technical articles appearing in nine different technical scientific publications are also included in the summaries given.

CIRCULAR 79—RULES AND REGULATIONS FOR THE SIXTH UTAH INTERMOUNTAIN EGG-LAYING CONTEST

Byron Alder

The rules and regulations of the Sixth Utah Intermountain Egg-laying Contest, which began on November 1, 1929, extending for a period of 51 weeks, are discussed in this circular. A brief discussion is also given on the general care and management which the birds receive while in the contest.

CIRCULAR 80—DOMESTIC SLAUGHTERING, CUTTING, AND CURING OF PORK

Harry H. Smith

The twenty pages of this booklet clearly describe each step involved in the slaughtering and curing processes. Numerous illustrations are given which are an aid in following the directions given. In addition to the simple rules given for the slaughtering, cutting, and curing of pork, lard-making, pickling pigs' feet, and the making of headcheese or souse are briefly described.

CIRCULAR 81—BEEF SLAUGHTERING, CUTTING, AND CURING

Harry H. Smith

In this circular the author includes the characteristics of good meat, the necessary tools and equipment in the slaughtering, cutting and curing the beef, the selection of the animal, the care of the animal before slaughtering, sticking, skinning, and eviscerating, cutting, and methods of keeping or preserving meat. The organization of community beef rings is also included.

CIRCULAR 82—LAMB SLAUGHTERING AND CUTTING

Harry H. Smith

This 16-page publication is a companion circular of Nos. 80 and 81 and in clear and concise manner brings to the attention of farmers and others interested the methods involved in the slaughtering and cutting of lambs. Attractive and detailed illustrations are included in the circular.

CIRCULAR 83—PLANNING, PLANTING, AND CARING FOR THE YOUNG ORCHARD

F. M. Coe

Circular 83 is a complete though concise manual on establishing the orchard and its early care. It is designed to bring to the planter the accumulated experience of growers, together with the latest methods developed by scientific research, thus enabling him to avoid the many mistakes so commonly made in establishing orchards, mistakes which lead to reduced returns and often failure. Subjects covered are: Factors to consider in determining when to plant an orchard, choosing a region, locating the orchard, selection of trees and rootstocks, planting plans and distances, laying out the orchard, pollination requirements, handling and planting trees, managing the young orchard, and protection from insects, diseases and rodents. Planting plans and methods of laying out orchards are illustrated by diagrams.

CIRCULAR 84—BUILDING YOUNG DECIDUOUS FRUIT TREES

F. M. Coe

Circular 84 contains the latest information on pruning and training young orchard trees, with special emphasis on growing low, wide-spreading trees which will bear maximum crops at minimum expense. "Modified leader" pruning, to secure mechanically strong crotches holding heavy loads of fruit without breakage or bracing, is described and illustrated. Fundamental principles of tree nutrition governing pruning as well as detailed directions for pruning the different fruits grown in this region are given and illustrated.

CIRCULAR 85—CHLOROSIS: YELLOWING OF PLANTS

Frank B. Wann

As suggested by the author in this publication, the most frequent cause of chlorosis is the lack of nitrogen, magnesium, and iron in the plant itself. However, an excess water-supply or an over-abundance of alkali salts in the soil may also be contributing factors as well as low temperatures and lack of light. Two possible methods of control are suggested: (1) The mechanical application of iron on the plant by spraying or by its injection into the plant body and (2) soil treatment consisting of the addition of manure, ammonium sulfate, or sulfur to the soil.

CIRCULAR 86—COCCIDIOSIS OF CHICKENS

D. E. Madsen

In a four-page circular the author briefly defines coccidiosis of chickens, giving the general nature of the disease, its symptoms, its lesions, and its diagnosis. Preventive measures with sanitation as the foundation of control, are also included as well as the general treatment of the disease. In a one-page drawing is given the infection cycle of the disease, which is completed in from eight to ten days.

CIRCULAR 87—RAISING DAIRY CALVES

George B. Caine

According to this publication, successful dairy-calf production is based (1) upon high-producing parents of good type, (2) upon special care of both dam and calf at birth, (3) upon proper kind and amount of feed, (4) absolute cleanliness of pails and pens, and (5) free access to hay and grain as soon as they will eat it. This circular also includes information on teaching the calf to drink; changing to skim milk; calf ties, pens, and stanchions; dehorning; milk substitutes; and common diseases of calves.

ABSTRACTS OF SCIENTIFIC AND TECHNICAL ARTICLES[3]

REPRINTS

Reprint 129.—Is Sulphur a Limiting Factor of Crop Production in Some Utah Soils? By J. E. Greaves and W. Gardner. **SOIL SCIENCE, 27: 445-457** (June, 1929). The native sulfur content of the soils studied varied from 252 to 1764

[3]The supply of scientific and technical reprints is limited; it is, therefore, impossible to supply all requests made.

pounds per acre-foot of 3,600,000 pounds. This is being supplemented by the sulfur applied with the manure, irrigation, and rain water. The quantity brought to the soil by irrigation waters varies from 3 to 676 pounds of sulfur per acre-foot of water. Annual precipitation averages 9.5 pounds for the soil considered. The quantity removed from the soil varies with the soil, crop, and method of cropping. From all the data available it is concluded that sulfur may become a limiting factor of crop production in some Cache Valley soils. The time required for this to manifest itself in diminished crop returns will vary with the soil, the specific irrigation water used, and the crop grown upon the soil.

Reprint 130.—The Tribe Pemphigini (Aphididae) in Utah. By Asa C. Maxson[4] and G. F. Knowlton. **ANNALS ENT. SOC. AMER.,** 22: 251-271 (June. 1929). This paper discusses nine species of Pemphigini which form galls on the poplar and one that rolls the leaves of ash trees. The sugar-beet root-louse is the most important form discussed, being frequently destructive in sugar-beet fields of Utah. An effort is made to distinguish between three species of the genus **Pemphigus** which are frequently confused.

Reprint 131.—Comparative Acre-yields of Sugar-beet Varieties in the United States and Canada during 1928. By George Stewart. **JOUR. AMER. SOC. AGRON.,** 21: 771-791 (July, 1929). This is a report of about 20 sugar-beet variety trials in various parts of the United States and Canada made available for comparative study. Most of the common commercial varieties, though not all, were included in each test. The varieties are arranged in order according to the acre-yield of sugar and they are given relative positions. The variation was rather large, but certain of the varieties, at least in the irrigated region, seemed to be somewhat more consistent performers than were the others.

Reprint 132.—Correlated Inheritance in a Wheat Cross between Federation and a Hybrid of Sevier x Dicklow. By George Stewart and D. E. Heywood[5]. **JOUR. AGR. RSCH.,** 39: 368-392 (September, 1929). Wheat crosses involving the Sevier variety as one parent had previously given peculiar genetic behavior. A segregate derived from one of these crosses, in which Dicklow was the other parent, was crossed with Federation. The peculiar genetic behavior was again consistently manifest. Inheritance studies are reported with reference to color of glume, awn class, spike density, awn length, neck thickness, culm length, and number of culms. Some interesting correlations are reported in which **eta** (correlation ratio) was used to indicate the presence of hidden or non-linear correlations. In two cases the locations of the non-linear correlations were discovered.

Reprint 133.—Influence of Organic Manures on the Chemical and Biological Properties of Arid Soils. By J. E. Greaves. **JOUR. AMER. SOC. AGRON.,** 21: 979-984 (October, 1929). It was found that the application of organic manures to the irrigated and dry-farm soils of Utah increases the ammonifying, nitrifying, and nitrogen-fixing powers of the soil. The grains in nitrogen, due to non-symbiotic nitrogen-fixers occurring under vegetation-house conditions, varied from 0 to 304 pounds per acre-foot of soil. The greatest gains occurred where legumes were used as the manure. The annual acre-gains occurring in the soil under field conditions and attributable to non-symbiotic nitrogen fixation was 44 pounds. Approximately 3000 pounds of applied organic material was decomposed annually.

[4]In Charge of experimental research, Great Western Sugar Co., Longmont, Colorado.
[5]Graduate Student, Department of Agronomy.

Reprint 134.—Some Aphid Notes from Utah. By G. F. Knowlton. **PAN-PACIFIC ENTOMOL.,** 6: 33-42 (July, 1929). Twelve species of aphids are considered in this paper, two species and one variety being described as new. Notes on a few species of economic importance are included. This is one of a series of papers dealing with the plant lice of Utah.

Reprint 135.—The Effect of Rain on the Snow Cover. By. G. D. Clyde. **MONTHLY WEATH. REV.,** 57: 328 (August, 1929). Experiments were conducted by the Utah Experiment Station on the Wasatch Plateau at 8700 feet elevation to determine the effect of rain on the snow cover. Fluorescein was used as a coloring matter to trace the path of the water through the snow. Fluorescein was placed on the snow surface before a rain, during a rain, and also upon melting snow and frozen snow surfaces. Fluorescein placed on the snow before and during a rain storm was carried through the snow column immediately after the rain began. That which was placed on a melting snow surface on a hot day traveled slowly downward through the snow column. That which was placed on a frozen snow surface remained stationary, showing no movement through the snow layer. Laboratory experiments using snow cores and artificial rain indicated that rain falling on a snow cover plays only a minor part in melting the snow cover.

Reprint 136.—Notes on a Few Homoptera from Utah. By G. F. Knowlton. **FLORIDA ENTOMOL.,** 13: 45-51 (September, 1929). This paper lists 65 species that have been collected and determined, several of which have not formerly been recorded from the state. Several of the species mentioned, such as the beet leafhopper and buffalo tree hopper are common and destructive to garden and orchard crops.

Reprint 138.—Saving Time and Storage in Breeding Sugar-beets. By George Stewart. **SCIENCE,** 70: 458 (August, 1929). Experiments conducted at the Utah Station have shown that it is possible to save one season of the two ordinarily required in producing sugar-beet seed for breeding purposes. Seeded in the greenhouse at the right time, beets may be grown over winter and reach such size and age that most of them will produce seed the following summer, when transplanted into the field. Lighting in the greenhouse was also required for the best results.

Reprint 138.—The Microflora of Leached Alkali Soils: 1. Synthetic Alkali Soil. By J. Dudley Greaves[6]. **SOIL SCIENCE,** 28: 341-346 (November, 1929). It has been found that when salts are applied to soils and then leached from them these soils gain in nitrogen. From such a soil 16 microorganisms were obtained in pure cultures. Of this number, 12 fixed nitrogen when cultured in soil to which a suitable carbohydrate had been added. The extent of the fixation varied with the specific microorganisms and the carbohydrate which was added to the soil. It is believed that these organisms are responsible for the gains which have been noted to occur in the soil.

Reprint 139.—Change in Density of Snow Cover with Melting. By G. D. Clyde. **U. S. MONTHLY WEATH. REV.,** 57: 326-327 (August, 1929). Studies were made on snow melting characteristics at an elevation of 8700 feet on the Wasatch Plateau in central Utah. The density of the snow cover at the beginning of the melting seasonal was variable; however, as the season advanced the density increased to a maximum just after the water started leaving the snow. The density at which the water starts leaving the snow is not constant but seems to depend

[6]Graduate Student, Department of Chemistry and Bacteriology.

upon the rate of increase in density. The maximum density recorded during these experiments was 50.1 per cent and was reached after 25 per cent of the water had left the snow cover. The density decreased rather quickly to between 35 and 40 per cent and remained nearly constant until all the snow had disappeared.

Reprint 140.—Stem-Rust-Resistant Segregates from Wheat Crosses between Two Susceptible Parents. By George Stewart. **PHYTOPATH.,** 19: 1129-1130 (December, 1929). The second case of obtaining segregates resistant to black stem rust from two susceptible parents is here reported. The wheat cross, Sevier x Federation, was made at the Utah Station in an effort to improve economically the quality and yield of wheat. Federation is fully susceptible and Sevier only slightly resistant. A resistant segregate was obtained from this cross, the resistance of which is designated as fully resistant (R).

Reprint 141.—Snow-Cover Measurements in Utah, 1914-29, incl. By G. D. Clyde. **HYDRAULIC ENGINEER.,** 5: 32-36, 43 (December, 1929)[7]. Snow-cover measurements in Utah made by the U. S. Weather Bureau, in cooperation with the U. S. Forest Service, are not indicative of actual water-shed conditions. Measurements on snow cover from 1923-29 made at the Utah Agricultural Experiment Station show that snow depth alone is not a good indicator of the probable water-supply and that measurements made at the end of December, January, and February are not indicative of the resulting water-supply.

Reprint 142.—The Microflora of Leached Alkali Soils: II. A Leached Sodium-Chloride Soil. By J. Dudley Greaves[8]. **SOIL SCIENCE,** 29: 79-83 (January, 1930). Some natural-occurring alkali soils have been found to increase in nitrogen after leaching. From such a soil 31 microorganisms were obtained and studied in pure culture. Eleven of these organisms fixed nitrogen where cultured in soil. It is thought probable that they play a part in observed soil gains in nitrogen.

Reprint 143.—A Few Match Brush Aphids from Utah. By H. J. Pack[9], G. F. Knowlton. **CANAD. ENTOMOL.,** 61: 199-204 (September, 1929). This paper describes, as new, five species of aphids occurring on species of **Gutierrezia.**

Reprint 144.—An Index of Friability of Soils. By Oswald Christensen[10]. **SOIL SCIENCE,** 29: 119-135 (February, 1930). In this article an attempt is made to define the term **friability** in such a way as to make it susceptible of measurement by elementary processes. It is pointed out that this characteristic describes in a qualitative way the physical nature of the soil but that it has not heretofore been defined in a sufficiently specific manner as to render it useful as a quantitative index. The definition proposed is the ratio of unit deformation at the yield point under a compression test to the work of deformation, the dimensions being the reciprocal of a pressure. Considerable experimental data are presented illustrating the method devised for its measurement and its variation with the nature of the soil and with the moisture content.

Reprint 145.—Physician's Test for "Curds and Whey" Finds the Best Milk for Baby's Bottle. (Relates to R. L. Hill's Curd Test). **SCIENCE NEWS-LETTER, 17: 68-69, 76** (February 1, 1930), Series 460[11].

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[7]Supply exhausted.
[8]Graduate Student, Department of Chemistry and Bacteriology.
[9]Deceased.
[10]Graduate Student, Department of Physics.
[11]No reprints available.

Reprint 146.—Soil Moisture Phenomena in a Saturated Atmosphere. By L. B. Linford[12]. **SOIL SCIENCE,** 29: 227-237 (March, 1930). In support of the assumption of zero angle of contact between water and soil particles, made by the author in a previous paper (SOIL SCIENCE, 22: 233-252, 1926), several experiments were reviewed which showed the angle to be zero for water in contact with glass. Experiments carried out showed the same for water and clean faces of many common soil minerals. Oiled surfaces showed large angles of contact. A monomolecular film of oleic acid on soil particles changed the capillary characteristics so much that there could not have been an appreciable coating on the untreated soil. Due to the slow diffusion of water vapor in air, the approach to an isothermal equilibrium between a saturated water vapor and a soil was shown to be too slow to detect by any but the most accurately controlled experiments, even though the moisture content of the soil be far from the equilibrium value.

Reprint 147.—Who Should Control the Public Domain? By George Stewart. **AMERICAN FORESTS AND FOREST LIFE,** 36: 156-160, 166 (March, 1930). In this publication consideration is given to the relative merits of the various possible methods of disposing of the remnant public lands in the West. Consideration is given to leasing, to allowing the lands to pass into private ownership, and to the desirability of state control; all are compared with federal control in which the U. S. Forest Service would be the directing agency. An attempt is made, also, to indicate the relation of some of the factors to the stability of the range livestock industry. The article is illustrated with six photographs and one map.

Reprint 148.—Notes on Utah Syrphidae. By G. F. Knowlton and H. J. Pack[13]. **PAN-PACIFIC ENTOMOL.,** 6: 182-189 (April, 1930). This paper is a partial list of the syrphid flies occurring in Utah. Many of the members of this dipterous family are decidedly beneficial in the control of aphids destructive in orchards and gardens.

Reprint 149.—Notes on Utah Coleoptera. By H. J. Pack[13]. **ENTOMOLOGICAL NEWS,** 41: 219-222 (July, 1930). This paper records 48 species of beetles that occur in Utah, some of which have not previously been recorded from this state. Most of the forms dealt with are long-horned beetles and click beetles.

Reprint 150.—The Effect of Barnyard Manure on a Calcareous Soil. By D. W. Pittman. **JOUR. AMER. SOC. AGRON.,** 22: 549-552 (June, 1930). Studies were carried on at the Greenville (Central) Experimental Farm near Logan, Utah, with certain typical manured and unmanured sugar-beet plats. Each plat was analyzed at different seasons on total nitrogen, nitrate nitrogen, and organic carbon. The soils were also tested for nitrification and for apparent specific gravity. By determining the coefficient of correlation between the yield of sugar-beets on these plats and the various soil properties studied, it was evident that the most significant correlation between the yield of sugar-beets and the nitric nitrogen in the soil occurred during June. It would seem, therefore, that on this highly calcareous soil farm manure is essential to sugar-beets largely because of the phosphorus available and in increasing the content of nitric nitrogen in the soil.

[12]Graduate Assistant, Department of Physics.
[13]Deceased.

LIST OF AVAILABLE PUBLICATIONS

Bulletins

122. Nature of the Dry-farm Soils of Utah.
128. Blooming Periods and Yields of Fruit in Relation to Minimum Temperature
132. Minor Dry Land Crops at the Nephi Experiment Farm.
137. Quality of Home-grown Wheat vs. Imported Wheat.
144. Water Table Variations—Causes and Effects.
150. Further Studies on Nitric Nitrogen Content of Country Rock.
152. Effect of Soil Moisture on Certain Factors in Wheat Production
159. Soil Moisture Studies under Irrigation.
160. Important Factors in Operation of Irrigated Farms.
161. Orchard Heating.
163. Composition of Irrigation Waters of Utah.
165. Labor Costs and Seasonal Distribution of Labor in Irrigated Crops.
173. Duty of Water in Cache Valley, Utah.
178. Irrigation of Barley.
181. Duty-of-Water Investigations in Coal Creek, Utah.
183. Water-holding Capacity of Irrigated Soils.
184. Farm Management Study of Great Salt Lake Valley.
185. Influence of Nitrogen in Soil on Azofication (Technical).
186. Irrigation Experiments in Sugar-beets.
187. Irrigation Experiments in Potatoes.
188. Maintaining the Productivity of the Soil.
189. Ridding the Land of Wild Morning Glory.
190. Corn Silage in the Dairy Ration.
191. Oedipodinae of Utah (Technical).
192. Biennial Report of Director, 1923 and 1924.
193. Cache County Water Conservation District No. 1.
194. Influence of Storage on the Composition of Flour (Technical).
195. Field Studies of Sugar-beet Nematode.
196. Fruit Tree Leaf Roller.
197. The Pear Leaf Blister Mite as an Apple Pest.
198. Report of Director for 18-Month Period, Jan. 1, 1925 to June 30, 1926.
199. Mutual Irrigation Companies in Utah.
200. Maintaining Potato Yields by Hill Selection.
201. Economic Insects in Some Streams of Northern Utah.
202. Some Observations on Winter Injury in Utah Peach Orchards.
203. Cattle Ranching in Utah.
204. Sheep Ranching in Utah.
205. The Beet Leafhopper in Utah.
206. Treehopper Injury in Utah Orchards.
207. Physical Curd Character of Milk and Its Relation to the Digestibility and and Food Value of Milk for Infants.
208. An Economic Study of the Apple Industry of Utah, 1926 and 1927.
209. Biennial Report of Experiment Station, 1926-28.
210. The Mineral Contents of Grains.
211. Corn Silage Varieties for Utah.
212. Studies on the Morphology of the Beet Leafhopper **Eutettix tenellus** (Baker)
213. Food Habits of Utah Farm Families.
214. An Economic Survey of the "Dixie" Section, Washington County, Utah.

215. Cost Reduction in Dry-farming in Utah.
216. Notes on Miscellaneous Insects of Utah.
217. Prices of Farm Products in Utah.
218. The Alfalfa-seed Chalcis-fly in Utah, 1927-29, inclusive.
219. Twenty-eight Years of Irrigation Experiments near Logan, Utah, 1902-29, inclusive.
220. Biennial Report of Utah Agricultural Experiment Station, 1928-30.

Circulars

12. Thinning Apples.
18. Better Horses for Utah.
21. Dry-farming in Utah.
22. Some Sources of Potassium.
23. The Seed Situation in Utah.
26. Storing Vegetables for Winter.
29. Control of Rodent Pests.
30. Codling Moth.
31. Alfalfa Weevil.
41. Soil Alkali.
44. Agriculture of Utah.
48. Rural Credits in Utah.
49. This Public Domain of Ours.
51. Foot-and-Mouth Disease.
54. The More Important Insects Injurious to the Sugar-beet in Utah.
57. Economy in Harvesting Sugar-beets.
58. Potato Production in Utah (Revision of Circular 40).
60. Seed Potato Control.
63. Tomato Culture in Utah.
64. Onion Growing in Utah.
69. Clean Milk and Its Production.
70. The Agricultural Outlook for Utah, 1928.
71. Weeds.
72. Brooding and Feeding Baby Chicks.
75. Selecting Dairy Cows.
76. The Utah Agricultural Experiment Station—What It Is, What It Is Doing, Etc.
77. Measurement of Irrigation Water.
78. Annual Summary of Publications.
79. Rules and Regulations for the Sixth Utah Intermountain Egg-Laying Contest.
80. Domestic Slaughtering, Cutting, and Curing of Pork.
81. Beef Slaughtering and Cutting.
82. Lamb Slaughtering and Cutting.
83. Planning, Planting, and Caring for the Young Orchard.
84. Building Young Deciduous Fruit Trees.
85. Chlorosis: Yellowing of Plants.
86. Coccidiosis of Chickens.
87. Raising Dairy Calves.
88. Annual Summary of Publications (July 1, 1929 to June 30, 1930).
89. Rules and Regulations for Seventh Utah Intermountain Egg-laying Contest.

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